

WHAT IS CLAIMED IS:

1. A method for determination for a given oil, the relative stability of a water-in-oil emulsion that will be formed by that oil with water comprising:

a) measuring for the oil the weight fraction of the oil that is most strongly adsorbed on a silica gel column successively eluted with n-hexane, toluene and methylene chloride-methanol mixture solvents;

b) determining whether said weight fraction is greater than about 0.05; with a value above 0.05 being determinative of an emulsion more stable than one with a value less than 0.05.

2. The method of claim 1 wherein said oil is a crude oil, crude oil distillate, residua from crude oil distillation and mixtures thereof.

3. The method of claim 1 wherein said water comprises halides, sulfate and carbonate salts of Group I and Group II elements of the long form of The Periodic Table of Elements and mixtures thereof.

4. The method of claim 1 wherein said water-in-oil emulsion has dispersed water droplets in the size range of 0.05 to 200 micron diameter.

5. The method of claim 1 wherein said methylene chloride - methanol mixture comprises methylene chloride and methanol in a ratio range of 99 parts of methylene chloride to 1 part methanol by weight to 80 parts of methylene chloride to 20 parts methanol by weight.

6. A method to desalt an oil comprising:

- a) measuring for the oil the weight fraction, C of the oil that is most strongly adsorbed on a silica gel column successively eluted with n-hexane, toluene and methylene chloride - methanol mixture solvents;
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- b) determining whether said weight fraction, C is greater than about 0.05, and, if above 0.05;
- c) treating the oil to obtain a treated oil wherein the weight fraction, C of the treated oil that is most strongly adsorbed on a silica gel column successively eluted with -hexane, toluene and methylene chloride - methanol
10 mixture solvents is less than about 0.05;
- d) adding water to the treated oil, in the range of 1 to 20 wt% based on the weight of the treated oil;
- e) mixing the treated oil and water to form a water-in-treated oil
15 emulsion;
- f) coalescing the water of the water-in- treated oil emulsion;
- g) separating the coalesced water to obtain a desalted crude oil.

7. The method of claim 6 wherein said oil is a crude oil, crude oil
20 distillate, residua from crude oil distillation and mixtures thereof.

8. The method of claim 6 wherein said treatment of the oil is selected from the group consisting of solvent deasphalting, thermal treatment for naphthenic acid reduction, electrochemical treatment for naphthenic acid reduction, blending with a second oil, chemical treatment for naphthenic acid conversion to naphthenate ester, naphthenic acid extraction treatment and combinations thereof.

9. The method of claim 6 wherein said coalescence is achieved by centrifugation, hydrocyclone treatment, electrostatic treatment, porous bed percolation and combinations thereof.

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10. The method of claim 6 wherein said methylene chloride - methanol mixture comprises methylene chloride and methanol in a ratio range of 99 parts of methylene chloride to 1 part methanol by weight to 80 parts of methylene chloride to 20 parts methanol by weight.

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11. A method to form an unstable water-in-oil emulsion from an oil and water comprising:

a) measuring for the oil the weight fraction, C of the oil that is most strongly adsorbed on a silica gel column successively eluted with n-hexane, toluene and methylene chloride - methanol mixture solvents;

b) determining whether said weight fraction, C is greater than about 0.05, and, if above 0.05;

c) treating the oil to obtain a treated oil wherein the weight fraction, C of the treated oil that is most strongly adsorbed on a silica gel column

successively eluted with n-hexane, toluene and methylene chloride - methanol mixture solvents is less than about 0.05;

d) adding water to the treated oil, in the range of 1 to 20 wt% based on the weight of the treated oil;

5 e) mixing the treated oil and water to form an unstable water-in-oil emulsion